

## **Historic, Archive Document**

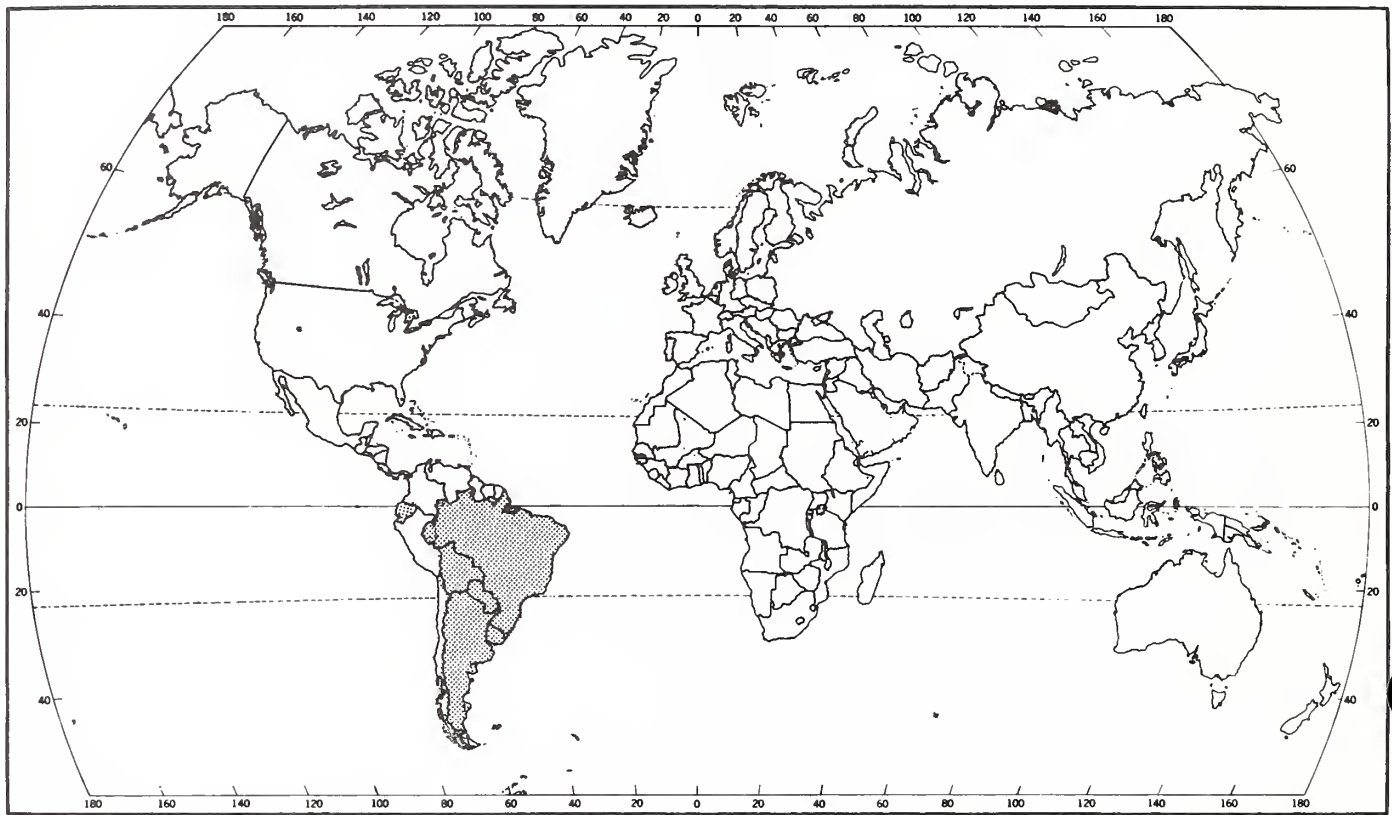
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PESTS NOT KNOWN TO OCCUR IN THE UNITED STATES OR  
OF LIMITED DISTRIBUTION, NO. 29: SWEET ORANGE SCAB

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Class:	Ascomycetes
Order: Family	Myriangiales: Myriangiaceae
Pest	SWEET ORANGE SCAB Teleomorph <u>Elsinoe australis</u> Bitancourt and Jenkins 1936 Anamorph <u>Sphaceloma australis</u> Bitancourt and Jenkins 1936 (Anamorph = asexual stage, teleomorph = sexual stage)
Selected Synonyms	Common names: Navel orange scab, sarna del naranjo duice, scabbia delle arance, sweet orange verrugosis, and verruga (Knorr 1963).  Scientific name: <u>Sphaceloma fawcettii</u> var. <u>viscosa</u> Jenkins 1933
Economic Importance	No data are available on yield reduction. Fruit spotted with this disease has its market value reduced and must be culled before shipping to fresh fruit markets. Culls may exceed 30 percent of the fruit in South American groves.
General Distribution	Argentina, Bolivia, Brazil, Ecuador, Paraguay, and Uruguay. The disease was noticed in Sao Paulo, Brazil, in 1934 (Knorr 1963). Earliest record known is from a speci- men collected in Paraguay, 1882. There have also been doubtful reports from Italy (Sicily), and Ethiopia (Eritrea). Other infections originally attributed to <u>E. australis</u> (Dominican Republic and New Caledonia) are now thought to have been caused by <u>Elsinoe fawcettii</u> Bitancourt and Jenkins (sour orange scab or, according to Whiteside 1978, citrus scab) and <u>Elsinoe fawcettii</u> var. <u>scabiosa</u> (McAlpine and Tyron) Jenkins (Australian citrus scab), respectively, (Commonwealth Mycological Institute 1976, Sivanesan and Critchett 1974, Knorr 1963).
Hosts	<u>Citrus sinensis</u> is the principal host. Also known from <u>Citrus</u> sp. (laranja cravo), <u>C. aurantiifolia</u> (lime), <u>C. hystrix</u> (Mauritius bitterorange), <u>C. limon</u> (lemon), <u>C. X nobilis</u> (king orange), <u>C. paradisi</u> (grapefruit), <u>C. reticulata</u> (mandarin orange), and <u>Fortunella margarita</u> (oval kumquat).



Elsinoe australis map prepared by USDA, APHIS, PPQ,  
Biological Assessment Support Staff

Varieties of sweet orange reported affected: Bahia Navel, Pera, Sabara, Selecta, Sao Sebastiao, Santos, Lima, Mangaratilia, Criolla (probably the same as Florida's pineapple), China sweet, Mediterranean sweet, Ruby blood, and Valencia (Knorr 1963).

#### Characteristic Damage

On fruit the large lesions are flattened and may be traversed by deep furrows from the rupture of corky tissues. Sometimes a circular fissure is present, easily detectable, leaving a scar covered with a silvery pellicle. The lesions are lighter in color, more nearly round, more flattened and less wrinkled than pustules of citrus scab (sour orange scab) which are irregular, wrinkled, and more spongy, and not typically discoid or crateriform as in Australian citrus scab.

The occasional pustules (less than 2 mm in diameter) that do occur on the leaves are found on the lower surface along the midribs (Miller, Seymour, Ducharme 1981, Knorr 1963).

#### Characters

In culture, on potato dextrose agar or wort agar, the fungi of sweet and of citrus (sour orange) scab have convoluted or pulvinate colony types, sometimes with viscid or gelatinous exudates. Growth of *E. australis* is more variable than *E. fawcettii*, with two groups described within the convoluted type of colony. Group I is light colored (cinnamon or cinnamon buff to clay color), group II is darker (black to pinkish vinaceous).

Rarely seen: Ascomata globose, separate or aggregated, pseudoparenchymatous, epidermal to subepidermal, up to 150 microns in diameter. Asci in the upper part of the ascoma, elliptical to subglobose, 8 spored, 15-30 X 12-20 microns. Ascospores hyaline, straight or curved, 1-3 septate, slightly constricted at the septa, but the upper middle cell may become longitudinally septate, 12-20 X 4-9 microns. Acervuli similar in appearance to ascomata. Conidiogenous cells formed directly from the upper cells of the pseudoparenchyma or from 0-3 septate conidiophores, hyaline to pale brown, monophialidic to polyphialidic, terminal, integrated, determinate, 6-18 X 4-5 microns. Conidia hyaline, aseptate, 4-6 X 2-4 microns (Sivanesan and Critchett 1974, Fawcett 1936).

#### Detection Notes

1. Primarily a fruit spot, leaves remarkably free of lesions even in severe cases. A casual glance gives impression of a scale insect. Frequently, the scab tissues have a reddish tinge which is also noted in the rind surrounding the scab.
2. Citrus (sour orange) scab occasionally occurs on sweet orange (rind only as observed in Florida, Whiteside 1975) and varieties of the other hosts listed above but is rougher (resembling tiny cauliflowers) and is common on leaves except those of sweet orange.
3. A strong hand lens will reveal small buff to black dots in the sweet orange scabs not seen in sour orange scab; these fungus fruiting structures (acervuli) are occasionally concentrically arranged (Cordas 1971).

(Fig. 1)



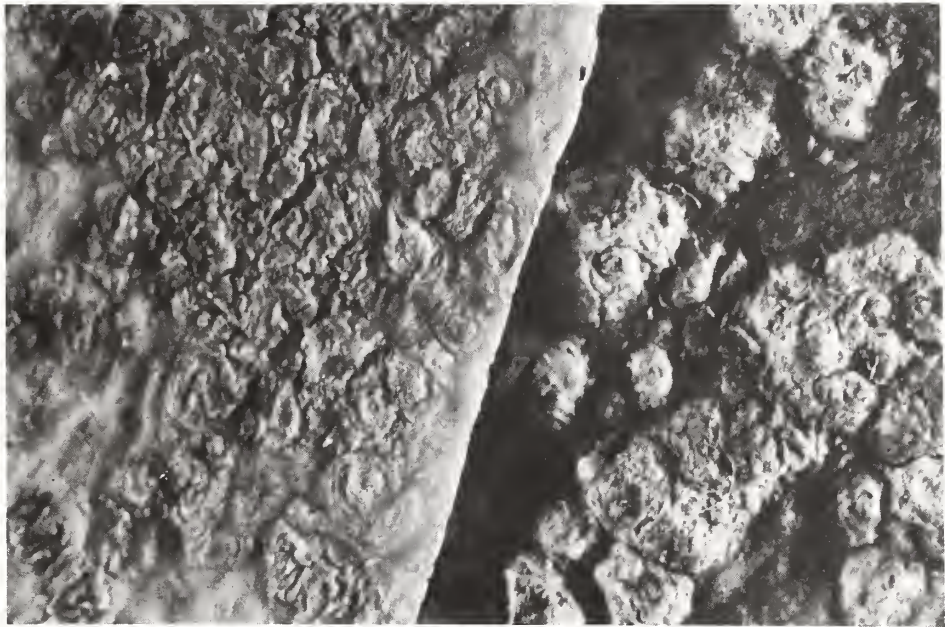
Elsinoe australis on sweet orange

(Fig. 2)



Elsinoe fawcettii on lemon

(Fig. 3)



Comparison of Elsinoe australis (left on sweet orange) and Elsinoe fawcettii (right on lemon) lesions

#### Biology

E. australis attacks only young tissues of the host. In culture, has an optimum growth temperature (24.5-29°C) higher than E. fawcettii (20-28°C). Transmission is most likely by wind and rain splash. Old lesions are the probable source of infective spores or conidia for each new season (Knorr 1963, Whiteside 1975).

#### Control

Prevent introduction through quarantine regulations. Once introduced, use a chemical control program similar to that for citrus scab (Knorr 1963, Whiteside 1978). See Miller, Seymour, and DuCharme 1981 for spray program used in Argentina and Brazil.

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